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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,596	02/27/2002	Hisaji Oyake	220143US2	7420

22850 7590 05/25/2004

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ALEXANDRIA, VA 22314

EXAMINER
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ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/083,596	<b>Applicant(s)</b> OYAKE ET AL.	
	<b>Examiner</b> Martin J Angebranndt	<b>Art Unit</b> 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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1. The response provided by the applicant has been read and given careful consideration.

The co-initiators are considered photoinitiators based upon the disclosed species and their prior use in photoresist compositions (See 4/1-5 and 4/17 in Loo et al. '332). Rejections of the previous office action, which are not repeated below are withdrawn based upon the amendments to the claims. Responses to the arguments of the applicant are presented after the first rejection to which they are directed.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,2 and 9 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 59-180839 (abstract included).

JP 59-180839 teaches with respect to figures 3a-d, the coating of the substrate (5) with a lower photoresist (10), a second photoresist (11), which is exposed and developed to form patterns (12', 13'). The laser used is not described. The lower and upper resists are both

sensitive to the same wavelengths, but have different degrees of photosensitivity and the different depths are achieved by different laser powers.

The claims do not preclude the light absorbing layer being photosensitive and the lower resist of the reference is held to meet this limitation. The applicant argues that the use of a co-initiator renders the absorption more efficient. As a generality, the spectral match is better, but a dye may have a stronger absorption than the photoinitiator, since the photoresist conventionally needs the light to be able to pass through the thickness of the resist to expose it through its thickness and allow the formation of deeper features. The claims do not specify amounts, a specific amounts of absorption, or that the co-initiator is matched to the photoinitiation system used in the resist. Therefore support for the breadth of the applicant's argument is lacking. The examiner also notes that without being part of a photosensitive layer (see instant specification (prepub at [0034]), which describes thermally crosslinked materials), photoinitiation ability has no meaning and the co-initiator or photoinitiator acts merely as an absorber and is equivalent to any other absorber, such as a dye or pigment.

5. Claims 1,2,6,7 and 9 are rejected under 35 U.S.C. 102(b) as being fully anticipated by JP 61-153850 (abstract included).

JP 61-153850 teaches a substrate (7), a lower photoresist (13) and an upper photoresist layer (14), which is then exposed using an He-Cd laser and developed to form the desired resist pattern., nickel is vacuum deposited on the patterned resists and electroformed to form an embossing master which is then used (abstract).

The claims do not preclude the light absorbing layer being photosensitive and the lower resist of the reference is held to meet this limitation.

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6. Claims 1,2,4,5 and 9 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Katsuda EP 708439.

Katsuda EP 708439 teaches with respect to figures 3a-d, the coating of the substrate (52) with a lower photoresist (121), a second photoresist (122), each of which are coated to a thickness of 100 nm, exposed and developed to form patterns (P2, P1) shown in figure 3 (4/28-49). The laser used has a wavelength of 363.8 nm (Argon ion laser). The lower and upper resists are both sensitive to the same wavelengths, but have different degrees of photosensitivity and the different depths are achieved by different laser powers. The differences in photosensitivity are achieved by using different amounts or types of benzophenone photoinitiators (table 1, page 3). The pit widths are disclosed with respect to figure 6 (4/19-27). The ratio of the thickness of one of the resists to the exposure wavelength is 0.27 (100 nm/363.8nm). The ratio of the pit width to the exposure wavelength is for the upper resists (#1 or #2 is 300/363.8 or 0.82.

The claims do not preclude the light absorbing layer being photosensitive and the lower resist of the reference is held to meet this limitation.

7. Claims 1,2,4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. '267, in view of Alles et al. '311 or Kamijima et al. '149.

Yamada et al. '267 teach optical disk mastering where the resist is coated to a thickness corresponding to the desired groove depth. This is generally between 40 and 100 nm. An argon ion laser is used to perform the exposure, followed by development, sputtering of nickel and electroplating to form a thick nickel master. The formation of grooves with pitches of 0.2 microns (200 nm) widths is disclosed. (10/37-11/10).

Alles et al. '311 teach antihalation layers comprising benzophenones (cyasorb) (9/44-50).

Kamijima et al. '149 teach antihalation layers comprising benzophenones (7/52-64).

It would have been obvious to one skilled in the art to modify the process of Yamada et al. '267 by adding an antihalation layer, such as that taught by Alles et al. '311 or Kamijima et al. '149 to prevent inadvertent exposure by reflection with a reasonable expectation of achieving the results. The examiner notes that the materials disclosed by the applicant as co-initiators are known to be useful in forming anti-halation layers used with photoresists.

8. Claims 1,2 and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katsuda EP 708439, in view of Pampalone et al. '614 and Specht et al. '844.

Pampalone et al. '614 teach absorptive dyes layers comprising a dyes, a monomer and a photoinitiator used to prevent halation (2/4-67). This is disclosed as the basis for inclusion of a dyes in a bilayer resist system (1/22-31).

Specht et al. '844 teach dyes as sensitizers/coinitiators for resists (4/56-7/53), the use of photoinitiator mixtures is disclosed. (7/56-11/22, particularly 11/20-22). The use of aminobenzoates as photoinitiators is disclosed. (9/38-57).

It would have been obvious to one skilled in the art to modify the cited example of Katsuda EP 708439 by adding a sensitizer and/or second photoinitiator as taught by Pampalone et al. '614 and Specht et al. '844 with a reasonable expectation of increasing the spectral response and sensitivity based upon the teachings of Pampalone et al. '614 and Specht et al. '844 and with a reasonable expectation of reducing halation as taught by Pampalone et al. '614.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ahn et al. '330 teach two resist layers in forming optical recording media stampers.

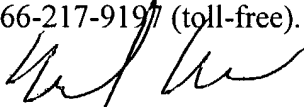
Jenkins et al., 'Fundamentals of Optics', (1976) pp. 655 teaches that 363.8 nm is the output of the Argon ion laser.

11 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebrannndt  
Primary Examiner  
Art Unit 1756

05/19/2004